

1. A tumbling apparatus for the tumbling processing of large amount of individual, irregularly shaped raw materials having non-uniform, different overall individual sizes including rock and stone into a finished, tumbled condition, the tumbling apparatus comprising:

- 5           a) a base frame configured for disposition on an underlying surface,
- b) a substantially hollow tumbling drum supported on said base frame for rotation thereon,
- c) said tumbling drum having a peripheral side wall and opposite longitudinal ends defining therebetween an interior tumbling drum cavity, one of said
- 10 opposite longitudinal ends forming a drum opening for passage of raw material therethrough into said drum cavity during rotation of the drum and for passage of tumbled material therethrough out of said drum cavity during rotation of said drum,
- d) power drive means for rotating said tumbling drum supported on said base frame,
- 15           e) means for communicating raw material to be tumbled in a first direction through said drum opening into said drum cavity during rotation of said tumbling drum on said base frame, and
- f) means for discharging finished tumbled material from said drum cavity in a second, opposite direction through said drum opening during rotation of said tumbling
- 20 drum on said base frame.

2. The tumbling apparatus of claim 1 including sorting means communicating with said drum opening for receiving tumbled material discharged in said second, opposite direction through said drum opening during rotation of said tumbling drum and sorting the material for separated discharge of individual material having a first  
5 predetermined size range to a first discharge destination, and discharge of individual material having a second, larger size range to a second, separate discharge destination.

3. The tumbling apparatus of claim 2 wherein said sorting means comprises a substantially cylindrical, perforate sizing ring member open at its opposite longitudinal ends and secured at one longitudinal end to said tumbling drum in position encircling and extending said drum opening, said sizing ring member formed with a plurality of sizing  
5 openings having a predetermined diameter, whereby material discharged in said second direction through the drum opening during rotation of the drum moves through and along said sizing ring member rotating therewith, material in said first size range falling through the sizing openings to a first discharge destination and material in said second, larger size range moving through the sizing ring member and out of its open longitudinal  
10 end to a second, separate discharge destination.

4. The tumbling apparatus of claim 3 including pressure spray wash means for rinsing the finished, tumbled material discharged through said drum opening as the material moves through and along said sizing ring member.

5. The tumbling apparatus of claim 1 wherein said means for discharging tumbled material from the drum cavity includes a powered tumbling drum tilt frame

rotatably supporting the tumbling drum on the base frame and operable to tilt the tumbling drum rotating on the base frame between a first, loading and tumbling position  
5 in which the rotating drum is tilted so that material tumbling in the drum cavity cannot move out of the drum cavity through said drum opening during rotation of the drum, and a second, discharge position in which the rotating tumbling drum is tilted so that material tumbling in the drum cavity moves toward and through said drum opening during rotation of the tumbling drum.

6. The tumbling apparatus of claim 1 wherein said means for communicating raw material into the drum cavity comprises a feed conveyor having an outfeed end movable into registry with said drum opening for conveying raw material in said first direction therethrough into said drum cavity during rotation of said tumbling drum.

7. The tumbling apparatus of claim 6 wherein said feed conveyor is mounted on and communicates with the interior of a feed hopper mounted on said base frame for movement toward and away from said tumbling drum for moving said outfeed end of the feed conveyor into registry with said drum opening for conveying raw material contained  
5 in the feed hopper to the drum cavity for tumbling, and moving the outfeed end of the feed conveyor out of registry with the drum opening during discharge of tumbled material through the drum opening and for refilling of the feed hopper with raw material for subsequent conveying to the drum cavity.

8. The tumbling apparatus of claim 1 wherein said base frame is configured as a mobile transport vehicle having ground-engaging wheels for supporting the vehicle

for transport along underlying road surfaces.

9. A tumbling apparatus for the tumbling processing of large amount of individual, irregularly shaped raw materials having non-uniform, different overall individual sizes including rock and stone into a finished, tumbled condition, the tumbling apparatus comprising:

- 5           a) a base frame configured for disposition on an underlying surface,
- b) a substantially hollow tumbling drum supported on said base frame for rotation thereon,
- c) said tumbling drum having a peripheral side wall and opposite longitudinal ends defining therebetween an interior tumbling drum cavity, one of said
- 10 opposite longitudinal ends forming a drum opening for passage of raw material therethrough into said drum cavity during rotation of the drum and for passage of tumbled material therethrough out of said drum cavity during rotation of said drum,
- d) power drive means for rotating said tumbling drum supported on said base frame,
- 15           e) means for communicating raw material to be tumbled in a first direction through said drum opening into said drum cavity during rotation of said tumbling drum on said base frame, and
- f) tumbling drum tilt means for longitudinally tilting the tumbling drum member during rotation on the base frame between a first, loading and tumbling position
- 20 in which the rotating drum is tilted so that material tumbling in the drum cavity cannot

move out of the drum cavity through said drum opening during rotation of the tumbling drum, and a second, discharge position in which the rotating tumbling drum is tilted so that material tumbling in the drum cavity moves toward and through said drum opening during rotation of the tumbling drum.

10. The tumbling apparatus of claim 9 including sorting means communicating with said drum opening for receiving tumbled material discharged in said second, opposite direction through said drum opening during rotation of said tumbling drum and sorting the material for separated discharge of individual material having a first  
5 predetermined size range to a first discharge destination, and discharge of individual material having a second, larger size range to a second, separate discharge destination.

11. The tumbling apparatus of claim 10 wherein said sorting means comprises a substantially cylindrical, perforate sizing ring member open at its opposite longitudinal ends and secured at one longitudinal end to said tumbling drum in position encircling and extending said drum opening, said sizing ring member formed with a plurality of sizing  
5 openings having a predetermined diameter, whereby material discharged in said second direction through the drum opening during rotation of the drum moves through and along said sizing ring member rotating therewith, material in said first size range falling through the sizing openings to a first discharge destination and material in said second, larger size range moving through the sizing ring member and out of its open longitudinal  
10 end to a second, separate discharge destination.

12. The tumbling apparatus of claim 11 including pressure spray wash means

for rinsing the finished, tumbled material discharged through said drum opening as the material moves through and along said sizing ring member.

13. The tumbling apparatus of claim 11 wherein said means for communicating raw material into the drum cavity comprises a feed conveyor having an outfeed end movable into registry with said drum opening for conveying raw material in said first direction therethrough into said drum cavity during rotation of said tumbling  
5 drum.

14. The tumbling apparatus of claim 13 wherein said feed conveyor is mounted on and communicates with the interior of a feed hopper mounted on said base frame for movement toward and away from said tumbling drum for moving said outfeed end of the feed conveyor into registry with said drum opening for conveying raw material  
5 contained in the feed hopper to the drum cavity for tumbling, and moving the outfeed end of the feed conveyor out of registry with the drum opening during discharge of tumbled material through the drum opening and for refilling of the feed hopper with raw material for subsequent conveying to the drum cavity.

15. The tumbling apparatus of claim 9 wherein said means for communicating raw material into the drum cavity comprises a feed conveyor having an outfeed end movable into registry with said drum opening for conveying raw material in said first direction therethrough into said drum cavity during rotation of said tumbling drum.

16. The tumbling apparatus of claim 15 wherein said feed conveyor is mounted on and communicates with the interior of a feed hopper mounted on said base

frame for movement toward and away from said tumbling drum for moving said outfeed end of the feed conveyor into registry with said drum opening for conveying raw material  
5 contained in the feed hopper to the drum cavity for tumbling, and moving the outfeed end of the feed conveyor out of registry with the drum opening during discharge of tumbled material through the drum opening and for refilling of the feed hopper with raw material for subsequent conveying to the drum cavity.

17. The tumbling apparatus of claim 9 wherein said base frame is configured as a mobile transport vehicle having ground-engaging wheels for supporting the vehicle for transport along underlying road surfaces.